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## PATENT SPECIFICATION

NO DRAWINGS

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## COMPLETE SPECIFICATION

## Antiperspirant Compositions

We, FISONS PHARMACEUTICALS LIMITED, a British Company, of 12 Derby Road, Loughborough, Leicestershire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is concerned with improvements in or relating to antiperspirant and antiperspirant/deodorant compositions. More particularly, the invention is concerned with liquid antiperspirant and antiperspirant/deodorant compositions which are suitable for application to the skin by means of a so-called "roll-ball" applicator or other device for spreading a layer of liquid on the surface of the skin.

Antiperspirant compositions generally contain an astringent metal salt, for example an aluminium salt. It is, however, a disadvantage of such compositions that the compositions are generally cloudy or milky in appearance and are often of a rather sticky consistency; thus reducing their aesthetic appeal.

It has now been found that clear antiperspirant composition may be made by incorporating aluminium chlorhydrate and a salt of an organic acid into an aqueous alcoholic vehicle, the aluminium chlorhydrate, organic acid salt and alcohol being employed in certain defined proportions.

According to the invention, therefore, there is provided a clear liquid antiperspirant composition comprising from substantially 10 to substantially 25% by weight, preferably about 20% by weight of aluminium chlorhydrate; from substantially 20% to substantially 60% by weight of a lower aliphatic monohydric alcohol containing from 1 to 8 carbon atoms or mixture of such lower aliphatic alcohols, preferably about 40% by weight of such a lower aliphatic monohydric alcohol; water; and a water soluble salt of a saturated, unsubstituted or hydroxy-substituted lower

aliphatic carboxylic acid containing from 1 to 8 carbon atoms, the organic acid salt being present in an amount of from 5 to 20% by weight based on the weight of aluminium chlorhydrate, suitably in an amount of about 10% by weight based on the weight of aluminium chlorhydrate.

By the term "aluminium chlorhydrate" as used herein, there is meant aluminium pentahydroxy chloride  $[Al_2(OH)_5Cl]$  which compound is generally employed in the form of its dihydrate. The viscosities of aluminium chlorhydrate solutions vary considerably depending upon their method of manufacture. The reason for this wide variation in viscosity is not fully understood but it has been found that a 50% aqueous solution of aluminium chlorhydrate having a viscosity between 5 and 30 centistokes at 20°C. is particularly suitable for use in the preparation of the compositions according to the invention. Solutions of higher viscosity may be used but in the case of the more viscous solutions it has been found that some experimentation may be necessary in order to determine the exact proportion of organic acid salt required to give an acceptable product; i.e. a product which does not have too high an initial viscosity and which does not increase in viscosity on standing.

The organic acid salts employed in the compositions of the invention may be for example, alkali metal, alkaline earth metal or ammonium salts. Preferred acids are malonic, citric and lactic acids; the particularly preferred salt being sodium lactate.

Suitable lower aliphatic monohydric alcohols for use in the compositions of the invention are methyl alcohol, ethyl alcohol and *n*-propyl alcohol; ethyl alcohol being preferred.

The antiperspirant compositions of the invention may also contain humectants, such as glycerol and sorbitol, which are suitably present in amounts of up to 5% by weight of the compositions. The compositions are clear

[Price 4s. 6d.]

Preferred deodorant germicides for use in the compositions according to the invention are quaternary nitrogen containing germicides

In order that the invention may be well understood the following examples of compositions according to the invention are given by way of illustration only.

Aluminium chlorhydrate, dihydrate	15.0	% by weight
Sodium lactate	2.0	— „ —
Hexachlorophane	1.0	— „ —
Ethanol	57.1	— „ —
Glycerine	3.0	— „ —
Water	21.9	— „ —

## EXAMPLE 3

Aluminium chlorhydrate, dihydrate	20.0 % by weight
Sodium lactate	2.0 — „ —
Rhudane paste	1.0 — „ —
Ethanol	47.0 — „ —
Glycerine	3.0 — „ —
Water	27.0 — „ —

## EXAMPLE 4

Aluminium chlorhydrate, dihydrate	20.0 % by weight
Sodium citrate, dihydrate	1.2 — „ —
B.T.C. 2125 (50% active)	0.5 — „ —
Isothan Q75 (75% active)	0.6 — „ —
Ethanol	47.0 — „ —
Glycerine	3.0 — „ —
Water	27.7 — „ —

## EXAMPLE 5

Aluminium chlorhydrate, dihydrate	20.0 % by weight
Sodium malonate	2.0 — „ —
B.T.C. 2125 (50% active)	0.5 — „ —
Isothan Q75 (75% active)	0.6 — „ —
Glycerine	3.0 — „ —
Ethanol	47.0 — „ —
Water	28.9 — „ —

## EXAMPLE 6

Aluminium chlorhydrate, dihydrate	15.0 % by weight
Sodium lactate	2.0 — " —
B.T.C. 2125 (50% active)	0.5 — " —
Isothan Q75 (75% active)	0.6 — " —
Ethanol	20.0 — " —
Glycerine	3.0 — " —
Water	58.9 — " —

## EXAMPLE 7

Aluminium chlorhydrate, dihydrate	20.0 % by weight
Sodium lactate	2.0 — " —
B.T.C. 2125 (50% active)	0.5 — " —
Isothan Q75 (75% active)	0.6 — " —
Ethanol	35.0 — " —
<i>n</i> -propanol	12.0 — " —
Glycerine	3.0 — " —
Water	36.9 — " —

## WHAT WE CLAIM IS:—

- 1) A clear liquid antiperspirant composition comprising from substantially 10 to substantially 25% by weight of aluminium chlorhydrate; from substantially 20% to substantially 60% by weight of a lower aliphatic monohydric alcohol containing from 1 to 8 carbon atoms or mixture of such lower aliphatic alcohols; water; and a water-soluble salt of a saturated, unsubstituted or hydroxy-substituted lower aliphatic carboxylic acid containing from 1 to 8 carbon atoms, the organic acid salt being present in an amount of from 5 to 20% by weight based on the weight of aluminium chlorhydrate.
- 2) A composition as claimed in claim 1 in which the aluminium chlorhydrate is present in an amount of about 20% by weight.
- 3) A composition as claimed in claim 1 or claim 2 containing about 40% by weight of said lower aliphatic alcohol or mixture of lower aliphatic alcohols.
- 4) A composition as claimed in any of the preceding claims in which the organic acid salt is present in an amount of about 10% by

weight based on the weight of aluminium chlorhydrate.

5) A composition as claimed in any of the preceding claims in which said organic acid salt is an alkali metal, alkaline earth metal or ammonium salt.

6) A composition as claimed in any of the preceding claims in which the organic acid salt is a salt of malonic citric or lactic acid.

7) A composition as claimed in claim 5 or claim 6 in which said organic acid salt is sodium lactate.

8) A composition as claimed in any of the preceding claims in which said lower aliphatic alcohol is methyl alcohol, ethyl alcohol or *n*-propyl alcohol.

9) A composition as claimed in any of the preceding claims also containing a humectant.

10) A composition as claimed in claim 9 in which said humectant is glycerol or sorbitol.

11) A composition as claimed in claim 9 or claim 10 in which said humectant is present in an amount of up to 5% by weight, based on the total weight of composition.

12) A composition as claimed in any of

the preceding claims containing up to 5% by weight of a deodorant germicide or a mixture of deodorant germicides.

- 5 13) A composition as claimed in claim 12 in which said deodorant germicide is present in an amount of less than 2% by weight, based on the total weight of the composition.

- 10 14) A composition as claimed in claim 12 or claim 13 in which said deodorant germicide is a quaternary nitrogen containing germicide.

- 15 15) A composition as claimed in claim 14 in which said deodorant germicide is an alkyl isoquinolinium halide or an alkyl dimethyl benzyl ammonium halide.

- 16) A composition as claimed in claim 12 or claim 13 in which said deodorant germicide

is hexachlorophene, chlorhexidine, or a charge transfer complex of an alkyl amino sulphonc acid, iodine and a non-ionic surface active agent.

- 20 17) A composition as claimed in claim 1 substantially as herein described.

- 25 18) A composition as claimed in claim 1 substantially as herein described with reference to the examples.

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